AGRICULTURAL EDUCATION MONTHLY.

U. S. DEPARTMENT OF AGRICULTURE,

STATES RELATIONS SERVICE.

AGRICULTURAL INSTRUCTION DIVISION.

Vol. II, No. 9. **December, 1916.**

CONTENTS.

	Page.
Blackberry and dewberry culture	67
How secondary schools may use Farmers' Bulletins on marketing	70
Control of house flies	71
Changes in title and form	73
Index to Volume II	73

BLACKBERRY AND DEWBERRY CULTURE.

SUGGESTIONS FOR TEACHING THE SUBJECT IN SECONDARY SCHOOLS.

INTRODUCTION.

The culture of blackberries and dewberries may be made of special interest to young people. As these berries may be grown in most sections of the United States, a consideration of this subject should be a part of most courses in agriculture. As the two berries are very closely related, they may be considered at the same time for convenience.

RELATION OF SUBJECT TO COURSE OF STUDY.

Place in agricultural courses.—Wherever these berries are important crops in a school district, their culture should be made a part of a general or elementary course. If more extensive courses are offered, the culture of blackberries and dewberries should be made a part of a general course in horticulture or a special course in bush fruits. The teacher should determine to what extent these berries are grown and what the possibilities are for developing the industry before deciding how much time to give the subject.

Correlation with other subjects.—As with other phases of horticulture, the production of these berries calls for the application of some of the principles of botany. If time allows, a study of the different types represented and their relationship to each other and closely related berries will prove of interest. What is the botanical classification of these berries? What is the nature of the fruit from the botanist's point of view? What means has nature provided for the propagation and protection of the species? These are suggestive of questions to show the connection between horticulture and botany. The question of securing pollination of some varieties and the fact that some of the newly introduced varieties are hybrids will also call for an application of botanical principles relating to reproduction. A study of the methods of some prominent plant breeders and their productions will prove of interest. A detailed study of diseases would call for a more advanced knowledge of botany than can be expected of secondary students, although they should understand the general nature of fungus parasites. Likewise, a study of animal parasites and their control calls for an application of the principles of zoology. The mixing of sprays to control these pests and the application of fertilizers calls for some practical knowledge of chemistry. Wherever separate courses in science have not been taken by the student, the teacher of agriculture must spend more time in making the underlying principles clear in their application.

USE OF ILLUSTRATIVE MATERIAL.

The school garden.—A part of the school farm or garden may be used to advantage as a horticultural museum in which living specimens of plants suited to the section may be found. In a row of blackberries and dewberries, one or two specimens of each variety adapted to the region may be grown, also wild berries of the neighborhood may be introduced with profit. New varieties may also be tried out so that the plat serves as a sort of plant introduction garden and variety test for the benefit of patrons as well as students. Although illustrated catalogues and other illustrations should be used freely in the classroom, the living plants serve best for a study of varieties.

Use of surrounding farms.—If the school does not have such a garden, visits may be made with profit to near-by farms where the berries are grown for the purpose of studying methods of culture as well as to study varieties of vines.

CLASSROOM INSTRUCTION.

Use of bulletins.—The culture of these berries is presented in a clear, concise manner in the following Farmers' Bulletins: No. 643, Blackberry Culture; No. 728, Dewberry Culture. These bulletins may take the place of a text and form the basis for the classroom discussion. As cultural methods vary in different sections of the country, these bulletins should be supplemented by State publications and such knowledge as teacher and students may glean as to the best methods used by local farmers. The questions which follow under each topic are intended to be suggestive of that which is to be brought out under a topic discussion rather than to suggest a question method of developing the lesson.

Introduction.—What proof do we have that the dewberry and blackberry are very closely related? How may we distinguish the blackberry canes or vines from those of the dewberry? Can you always distinguish the berries on the market? What advantages are there in growing dewberries over the production of blackberries? What disadvantages? Give the history of these berries in brief. Why has their cultivation increased comparatively slowly? Will it pay to grow these berries where they grow wild in abundance? How does the production of blackberries and dewberries in this State compare with other States? How does the production of this section compare with other parts of the State? What are the present possibilities for the production of these berries at a profit? Can they be marketed to advantage? What connection is there between the condition of the roads and the marketing of the berries?

Climatic and soil requirements.—Is there any danger to tender varieties of these berries in the lowest winter temperature of this section? What has the selection of a site to do with protection from cold and winds? At what time is an abundance of water especially needed? At what time may an overabundance of water be especially harmful? Why is a deep soil with good drainage needed? What type of soil is best suited to these berries? What may be done to increase production on light, sandy soils? Why is it better to have the land in cultivated crops two years before planting? What preparation should be given the soil immediately before planting? What is the value of subsoiling?

Propagation.—In the care and propagation of blackberries and dewberries what essential habits of growth must be kept in mind? Describe three methods of propagation, explaining why these berries may be so propagated. What should be the development of a plant before it is ready for permanent planting? Does the home production of nursery stock pay in the case of these berries?

Planting.—What is the best season for planting in this district? Why is the proper depth of planting important? How should the plants be prepared for planting? What precautions must be taken in setting the plants? What system of planting is best suited to this district?

What are the proper distances for planting? How many plants will be needed for an acre? What varieties are the best for this section? (The study of varieties should be determined by local needs.)

Cultivation and intercropping.—How long before the vines will bear and need all of the land? Will it be profitable to practice intercropping? What crops will be best suited to this section? Why should no more than one row of most crops be grown between the rows of berries? Why should frequent cultivations be made throughout the season? Why should the cultivation be shallow? Why will cultivation have to cease sooner with dewberries than with blackberries? What precautions must be taken in cultivating and handling the dewberry vines?

Fertilizers and cover crops.—What are the chief needs of local soils suited to these berries? How may these needs best be supplied? Why is barnyard manure generally to be preferred to commercial fertilizers? What is the danger of an overuse of fertilizers? When and how may fertilizers be applied to the best advantage? What are the advantages of green manures and cover crops? What cover crops are best suited to this section? How are such crops managed?

Systems of training and pruning.—What are the advantages in using some system of training? What system is the most popular in this section? What other systems might be used to advantage? (As different systems have loyal advocates, a brief debate on the merits of two popular systems may prove of profitable interest.) What is the purpose of cutting back the new growth? Why is it necessary to thin the new blackberry canes? When is the best time to cut back and thin out the new growth? When is the best time to cut out the old growth? What sort of protective dress must be used in handling the dewberry canes? How are dewberry plantations renovated which may have been injured by insects or disease?

Winter protection.—Will either blackberries or dewberries need winter protection in this section? What relation is there between hardiness and variety? What are the most efficient methods of covering the canes? At what time should they be covered? At what time should they be uncovered? What danger is there in covering them too deep?

Harvesting and marketing.—How do the times of ripening of dewberries and blackberries compare? When are the berries ready to pick? What precautions should be used in keeping the berries in good condition? What device will aid the pickers in their work? What sort of protective clothing may the dewberry pickers wear? How often should pickers go over the patch? What kind of crates are used for these berries? How much are pickers paid per crate? What prices should one expect on the local market? What yield may one expect? After crates and picking are paid for will the balance pay a profit on the cost of production? How long can one expect a plantation to endure in this section?

Insects and diseases.—The study of insects and diseases should be confined to those forms which are giving trouble locally or which threaten the berries in the district.

PRACTICUMS.

Propagation.—The propagation of plants of these berries, whether from roots, tips, or suckers, does not call for any great skill in handiwork; hence it does not provide a very desirable practicum for the class at school. The production of good nursery stock, however, is a worthy accomplishment. As it covers a considerable period of time, the production of a number of good plants may be assigned as an individual home practicum, either separately or in connection with a home project in berry production.

Pruning.—The cutting out of old canes and the cutting back of new ones furnish suitable work for the class at the school or on a neighboring farm. The work should be announced the day before, so the students may come with proper clothes and with tools if the school does not own them.

Making crates and carriers.—In sections where the berries are shipped usually the crates are purchased in "knock-down" form. The students should be given an opportunity to make these crates in a manner which will mean efficiency and skill with further practice. If the school does not have a shop, it is possible that practice may be secured on a near-by farm.

The making of carriers used by pickers offers another handicraft exercise well worth while. It is usually possible to secure one or more of the carriers most popular in the district to serve as models.

Picking.—In many berry-growing sections growers are dependent upon young people of school age for picking. The boys and girls have in such work an opportunity to start a savings account and learn ways of thrift as well as to develop skill in the handling of fruit. Because of a lack of instruction and supervision, often this work means a start toward habits of dishonesty and carelessness. While this work does not usually come on during the school year, in some districts the teacher of agriculture renders service during the summer months. In fruit-growing sections the teacher of agriculture can render real community service by offering his services as instructor and supervisor in such work as picking and packing. He should pay special attention to beginners in getting them started right. In a western school district the teacher of agriculture not only performed this service but also started a sort of employment agency where the services of the students were secured by appreciative patrons.

A HOME PROJECT.[1]

The production of blackberries and dewberries involves the propagation of plants and the care and management of the plantation until and after the time of bearing. This covers too long a period to fit with a course during one year of school, yet it would furnish an excellent project for a student in horticulture. To overcome the difficulty of the extended period of time a student may take as a project the care and management of a bearing patch of berries, preferably upon his own account. In connection with this he should start a row or two of new plants or produce some nursery stock to sell.

HOW SECONDARY SCHOOLS MAY USE FARMERS' BULLETINS ON MARKETING.

INTRODUCTION.

Farmers throughout the United States are awakening to a new interest in the business side of farming. Special attention is being given problems connected with the marketing of farm produce. Much can be done toward bringing the consumer and producer more closely together by making our future farmers acquainted with the agencies and organizations established for this purpose. One of the most important of these is the parcel post. A general consideration of marketing should be given emphasis in a course in farm management and rural economics. Special marketing problems should be considered along with the particular crop or phase of agriculture involved. The following are some suggestions as to how certain bulletins of the recently organized Office of Markets and Rural Organization of this department may be used in teaching the subject of marketing.

SUGGESTIONS FOR PARCEL POST MARKETING (FARMERS' BULLETIN 703).

As this bulletin is of a general nature, it will fit in well with a course in farm management. As it deals mostly with fruits and vegetables, it may also be used in a course in horticulture. Special consideration should be given this subject by students who have home garden and orchard projects and are depending upon a retail trade in the sale of their produce. Each student should become familiar with the zones surrounding the school district and determine

[1] For general information regarding home projects, see Department Bulletin 346, Home Projects in Secondary Courses in Agriculture.

the rates to near-by markets. The parcel-post rates should be compared with local express and freight rates. Practice should be given in packing and shipping produce according to directions in the bulletin. If possible, a plan of cooperation should be made whereby the members of a class in a near-by city school who are interested in the subject from the consumer's point of view would handle the shipments at the other end and report upon their condition.

SHIPPING EGGS BY PARCEL POST (FARMERS' BULLETIN 594).

This subject should be considered in a general course in agriculture where the students are interested in poultry and in connection with any special study of poultry. Special attention should be given the subject by those students engaged in poultry projects. The bulletin contains directions for carrying out the following practicums:

1. Handling eggs.
2. Preserving eggs in water glass.
3. Packing eggs for household use.
4. Packing eggs for hatching.

An effort should be made toward securing cooperation in the receiving of the eggs and reporting upon the conditions in which they arrive.

THE COMMERCIAL GRADING, PACKING, AND SHIPPING OF CANTALOUPES (FARMERS' BULLETIN 707).

This subject does not have as wide an application as the other two mentioned. In sections where the production of cantaloupes is an important phase of farming, the handling of the melons for the market should receive attention in the course in horticulture. Special emphasis should be given the subject in the case of students who are producing cantaloupes as their home projects. It may be possible for the students to visit a packing house and secure practice as a class. If this can not be arranged, or if all of the students are not interested in the subject, the teacher may plan for individual students to get practice and to give them credit for the work when skill has been developed.

CONTROL OF HOUSE FLIES.

SUGGESTIONS FOR TEACHING THE SUBJECT IN SECONDARY SCHOOLS.

INTRODUCTION.

If public sentiment against the house fly as a general nuisance and as a carrier of disease is to be made permanent, the subject should be considered in our public schools. It is especially important that rural schools consider the necessity of getting rid of flies, as the dangers are greatest in the country and organized agencies for control lacking.

RELATION OF SUBJECT TO COURSE OF STUDY.

A study of house flies and their relation to health is essentially a phase of biology. As the control of these flies is so intimately connected with the work of the housewife and the farmer, the subject should be considered in connection with home economics and agriculture. This subject furnishes an excellent example of the need for cooperation and correlation in the teaching of secondary students. If the general behavior and life history is made a part of the course in biology, this phase of the subject need not be repeated in the class in agriculture, which considers their control, except as a brief review. If the students are not taking courses in general biology, zoology, or sanitation, in which the habits of the house fly are considered in relation to the spreading of disease, this subject should be made a part of the study of economic ento-

mology wherever it may come in the agricultural course. Although house flies do not have a direct relation to crop production, their control has such a close connection with health and happiness on the farm that it should be considered as a phase of agriculture. The close relation to sanitation about the stable should make it a consistent part of a course in animal husbandry. Where dairying is taught as a separate course, the control of flies may well be considered in its relation to the production of clean milk and the general comfort of the cows. In schools where special courses in rural engineering or farm mechanics are given, the making of manure pits and flytraps will form suitable exercises for the practical work of such courses.

CLASSROOM INSTRUCTION.

Farmers' Bulletin 679, House Flies, will form a suitable basis for classroom discussion. Each student should secure a copy of this bulletin. Although the bulletin is well illustrated, the teacher should use whatever material he can secure in the way of charts which show the fly greatly enlarged and which show the method of spreading disease. As flies are so common, there is little excuse for not having living or mounted material at hand. Lenses will be necessary in making an examination of such details as the hairs and bristles which cover the body. In the courses in agriculture most emphasis should be given the part of the bulletin dealing with preventive and control measures.

PRACTICUMS.

1. *Collecting and mounting flies.*[1]—Each student should be required to collect and mount as many of the species described in the bulletin as he may obtain. An effort should be made to secure specimens of the four stages of the common house fly, viz, egg, larva, pupa, and adult. Specimens affected with the fungus disease, *Empusa muscæ*, should be obtained if possible, also specimens of centipedes to represent natural enemies of the fly.

2. *Making and operating flytraps.*—Each student should also be required to secure a copy of Farmers' Bulletin 734, Flytraps and Their Operation, and make either at home or in the school shop one of the flytraps described. As the conical hoop trap may be used under more general conditions, the plans for this trap should be taken up at the school. It will be well for the teacher to construct one of these traps as a demonstration and to serve as a model. Complete plans and directions are given in the bulletin. Each student should be required to demonstrate that his trap will work well.

At schools having a farm with a stable near the school, the making of a maggot trap such as described in Farmers' Bulletin 679 will be an excellent class project. The trap should furnish good practice in concrete construction, at the same time ridding the school of a dangerous nuisance and furnishing the community with a practical demonstration. In cases where water is not available, manure pits [2] should be constructed and the manure treated as suggested in the bulletin.

COMMUNITY SERVICE.

The making of flytraps in connection with a study of flies at the school should be but the beginning of a campaign to rid the community of flies. A contest should be conducted in the use of flytraps at home. It should not be difficult to get a public-spirited citizen to give a suitable prize to the student making the best record. A better form of contest would be that conducted between schools or communities. It will be a great advantage to have adjoining school districts take up the campaign at the same time, then community spirit may be developed in a friendly rivalry. Interest may be aroused by inviting outside speakers to give illustrated lectures on the subject.

---

[1] For directions for collecting and mounting, see Farmers' Bulletin 606, Collection and Preservation of Insects and Other Material for Use in the Study of Agriculture.

[2] Directions for making manure pits may be obtained from Farmers' Bulletin 481, Concrete Construction on the Live-Stock Farm.

CHANGES IN TITLE AND FORM.

This Monthly will be discontinued in its present form and superseded by a series of department documents under the title Secondary School Agriculture. This title should make it clear that the documents are intended primarily for teachers in secondary schools. For convenience in filing, the form will be changed to coincide with the majority of department and State publications.

In many cases the Monthly did not reach those for whom it was intended. The documents pertaining to secondary agriculture should not be retained by superintendents, principals, and other administrative officers where an agricultural instructor is employed; neither should it be considered as private property and taken from the school by the teacher. We urge upon all teachers the necessity of keeping a file of these documents with other agricultural publications. The material contained in them may not be of immediate service, yet it will prove useful in the future to whoever has charge of the work.

INDEX TO VOLUME II.

	Page.
Analysis of the farm business	22
Beekeeping as a subject of instruction in secondary schools	4
Blackberry and dewberry culture	67
Breaking and training colts	17
Bridge grafting of fruit trees	41
Colts, breaking and training	17
Concrete, use of, on the farm	35
Corn production, teaching, in secondary schools	43
Correlations (see each article).	
Dewberry culture	67
Farm business, analysis of	22
Flies, house, control of	71
Grasshopper, control of	19
Grafting, bridge, of fruit trees	41
Home projects. (See also project outlines.)	
Blackberries and dewberries	70
Breaking and training colts	19
Farm business analysis	24
Peach growing	16
Illustrative material, use of (see each article).	
Judging swine in secondary schools	51
Marketing, how secondary schools may use Farmers' Bulletins on	70
Milk, clean production of	37
Peach growing as a subject of instruction in secondary schools	9
Pigeons, squab raising	1
Poultry management	59
Practicums (see each article).	
Project outlines:	
Beekeeping	6
Corn production	48
Poultry management	64
Squab raising (pigeons)	2
Strawberry growing	33
Squab raising as a subject of instruction in secondary schools	1
Strawberry growing, instruction in	31
Swine judging, teaching, in secondary schools	51

WASHINGTON : GOVERNMENT PRINTING OFFICE : 1917